

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Amendment of Part 90 of the Commission's	)	WT Docket No. 01-146
Rules and Policies for Applications and Licensing	)	
of Low Power Operations in the Private Land	)	
Mobile Radio 450-470 MHz Band	)	

**COMMENTS OF MOTOROLA**

Motorola hereby submits these comments in response to the Notice of Proposed Rule Making in the above-captioned proceeding.<sup>1</sup> Motorola supports expeditious FCC action in this proceeding to finalize a regulatory environment that supports the existing market demand for UHF private land mobile low power operations.

**Background**

As a by-product of the FCC's *Refarming*<sup>2</sup> proceeding, the Land Mobile Communications Council (LMCC) has recommended that the Commission designate 104 channel pairs in the 450 MHz private land mobile band for low power use. Many of the LMCC's recommendations could be implemented without need for FCC rule changes as earlier Commission decisions delegated authority to the frequency advisory committees to reserve frequencies for low power use.<sup>3</sup> However, the subject *Notice* does identify certain rule changes that would be necessary if

---

<sup>1</sup> *In the Matter of Amendment of Part 90 of the Commission's Rules and Policies for Applications and Licensing of Low Power Operations in the Private Land Mobile Radio 450-470 MHz Band*, WT Docket No. 01-146, *Notice of Proposed Rule Making*, FCC 01-199, released July 24, 2001 (*hereafter Notice*).

<sup>2</sup> *See, e.g., Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile Services*, PR Docket No. 92-235, *Report and Order and Further Notice of Proposed Rule Making*, 10 FCC Rcd 10,076 (1995).

<sup>3</sup> *Refarming R&O* at ¶64.

the Commission were to fully implement the LMCC's recommendations, such as increasing power (*i.e.*, 5 watts output power instead of 2 watts) on certain "low power" channels. The *Notice* seeks comment on such rule changes and also on other matters related to low power operations in the 450 MHz private land mobile band.

### **Codification of the Low Power Pool**

As a preliminary matter, the Commission asks whether or not the Low Power Pool as envisioned by the LMCC should be incorporated into Part 90 of the FCC's Rules or if it should be memorialized as a list maintained by each of the coordinators and provided to the public upon request.<sup>4</sup> The FCC argues that if the low power pool designations were included in the Code of Federal Regulations, making changes to the number of frequencies could be a time-consuming process, whereas a simplified process could be used if the lists were maintained by the frequency coordinators.

To the extent that it will assist the frequency coordinators in enforcing these policies, Motorola supports codification of the LMCC's proposals. This will help the frequency coordinators properly administer the use of these channels. Also, codification would eliminate the possibility that future, new frequency advisors that are not a part of this consensus could coordinate non-compliant uses on these channels.

### **Voice and Non-Voice Operations on the Low Power Pool Channels**

Throughout the *Notice*, the FCC asks for comment on whether telemetry or data operations should continue to be permitted on the Group A, C and D channels.<sup>5</sup> Specifically, the Commission asks for comment on whether low power data operations should be limited to the

---

<sup>4</sup> *Notice* at ¶29.

<sup>5</sup> *See, e.g., Notice* at ¶30.

Group B channels and whether Groups A, C and D should be designated voice-only. The Commission has asked whether or not data and voice systems can co-exist on the same channels.

The Commission appears to use the terms “telemetry” and “data” interchangeably. While telemetry is certainly data, all data is not telemetry. The transmission of data can occur through mobile or fixed units. Telemetry is a fixed use of data, usually between a central point and several fixed remote points that transmit data intermittently to the central point. The central point “polls” the remote stations, asking essentially “are you OK?” The remote point responds with either “yes” or “no”. Such devices are often used, for example, to monitor and control water levels, traffic signals, railroad signals, and gas or electric transmission lines. Motorola believes that fixed data should continue to be permissible on a secondary basis in both the low power and high power frequency pools, as it has historically been available. Mobile data systems should continue to be considered co-primary with mobile voice communications.

Motorola also recommends that the FCC modify 90.187 to provide a protected service area mechanism for mobile data operations. In the four years since the LMCC developed its recommendations for a Low Power Pool, the needs of private wireless users has changed significantly. Users are increasingly dependent upon data and digital technologies – both spectrally efficient technologies. These technologies work best in an environment where the user has a protected service area (PSA).

The migration to digital modulation and the ability to provide data service on digital voice systems is blurring the distinction between “voice” and “non-voice” signals and systems. In the spectrum-sharing environment below 512 MHz, FCC rules currently treat digital voice and mobile data systems as co-equal to analog voice systems. However, private mobile data systems or conventional digital voice systems are not treated as co-equal to trunked voice systems in that

there is no means available within the existing rules for such systems to obtain a Protected Service Area (PSA). Non-voice, mobile data only systems are spectrum efficient, manage their use of the spectrum, and should be accorded the same opportunity to obtain a protected service area as trunked voice systems.

The only mechanism currently available under the rules to obtain a PSA is in rule section 90.187, which provides protected service contours for trunked systems that meet certain criteria. The underlying tenant of 90.187 is to establish operational conditions conducive to the deployment of spectrally efficient systems. Multi-channel trunked systems with centralized control provide a 2:1 to 3:1 increase in efficiency over conventional non-trunked systems. These systems require constant carrier control channels and therefore need the option for a more protected environment in spectrum below 512 MHz as provided by Section 90.187.

However, multi-channel trunking is not the only spectrally efficient technology. Both data systems and digital systems are very efficient technologies that use spectrum very densely. Digital systems can transmit bits of data mixed in with the encoded voice, combining features that would normally be available only in trunked systems. Digital systems also offer the ability to encrypt messages eliminating the possibility of eavesdropping. Many trunked voice systems using digital modulation already provide non-voice (data) services, which for co-channel sharing (and interference) concerns are indistinguishable from digital voice transmissions. Similarly, like trunking, digital voice systems available today provide spectral efficiency gains over conventional analog voice systems.

Data systems that meet the current FCC efficiency standards of a 9.6 kbps data rate in a 12.5 kHz channel or a 19.2 kbps data rate in a 25 kHz channel have an increased spectrum efficiency over trunked voice systems by a conservative factor of 2:1 to 3:1 or from 4:1 to 9:1

over conventional analog voice systems. Like centralized trunking, these increases in efficiency can only be realized when the data system operates in a continuous carrier mode and manages channel utilization without having to monitor or share the channel with other traffic.

Motorola recommends that Section 90.187 be modified to include the opportunity for other spectrally efficient technologies to achieve a PSA status. A draft revision of that rule section is attached as Appendix A. Motorola does not recommend any changes in the protection criteria so there is minimal burden on the Commission and Frequency Coordinators to implement this increased flexibility for licensees willing to invest in these efficient data and conventional digital voice systems. Applicants seeking to obtain a PSA would have to comply with the current trunking “band clearing” rules per 90.187 – either gain consent, move incumbents, or provide engineering analyses which demonstrate that the private mobile data or digital system would not overlap any existing co-channel or adjacent channel (depending upon the private mobile data or digital system’s proposed bandwidth) service area.

Modifying 90.187 as part of the current low power proceeding provides licensees an additional option to implement spectrally efficient systems that meet their needs on low power channels and former low power channels that are being converted to full power use. However, there seems to be no logical reason to segregate the low power channels as the only ones below 512 MHz that are afforded this flexibility. Therefore, in order to make the best use of the spectrum available, we recommend that the attached suggested changes to 90.187 be applied to all coordinated Part 90 channels in bands under 512 MHz.

### **Low Power UHF Channels for Uncoordinated Operations**

The *Notice* proposes to adopt in somewhat modified form the LMCC’s recommendations that a substantial portion (*i.e.*, 25 channel pairs) of the low power pool be made available for

uncoordinated operations.<sup>6</sup> The *Notice* indicates that these channels would be used primarily by small businesses, such as electricians, plumbers, and others who need short-term, on-site communications.<sup>7</sup> The *Notice* tentatively concludes that such uses would derive little benefit from site-specific frequency coordination and thus, proposes to exempt these channels from the provisions of Section 90.175 of the Rules.<sup>8</sup>

Motorola strongly supports the creation of the *Group C* uncoordinated low power pool channels for business and industrial users. In Motorola's view, it is critical that the FCC move swiftly to implement the full complement of channels recommended by the LMCC for these purposes as our experience indicates strong markets for both coordinated and uncoordinated, itinerant low power services in this band. Since the FCC has chosen to reallocate the Part 90 VHF "color dot" frequencies to the personal radio services, this UHF pool of frequencies is urgently needed for those displaced business/industrial users that cannot operate in a mixed business/consumer environment.<sup>9</sup>

Motorola is gratified that the *Notice* tentatively concludes to adopt most of the LMCC's recommendations as submitted. Motorola does disagree, however, with the FCC's assessment that four of the LMCC's recommended frequencies (467.7625 MHz, 467.7875 MHz, 467.8125

---

<sup>6</sup> *Notice* at ¶21.

<sup>7</sup> *Id.*

<sup>8</sup> *Id.* at ¶25.

<sup>9</sup> In WT Docket No. 98-182, the FCC reallocated 5 VHF business/industrial low power channels to a new personal radio service called the Multi-Use Radio Service (MURS) where users would be licensed by rule rather than individual license. Motorola has pending a petition for reconsideration of this decision essentially to preserve the business/industrial use eligibility restrictions on these channels. However, in July of 2001, Motorola filed supplemental comments in that proceeding recommending that the FCC defer full implementation of the MURS service until two years after the effective date of a future Report and Order in this instant proceeding adopting the LMCC Low Power Pool recommendations. *See, Supplemental Comments of Motorola*, WT Docket No. 98-182, submitted July 2, 2001.

MHz, and 467.8375 MHz) may not be appropriate for inclusion in the *Group C* allotment because they are currently designated under Part 90 rules for dockside operations on a primary basis as well as continuous carrier radio remote control and telemetering functions. Motorola does not believe that uncoordinated, low power operations would be incompatible with dock-side operations and, in any event, there are substantial portions of the country where dockside operations are not relevant. Where continuous carrier telemetry operations are used, Motorola believes that these pose a greater threat of interference to the itinerant user than *vice versa* which will typically be resolved by the itinerant user simply changing frequencies.

Motorola understands the FCC's tentative proposal to defer inclusion of 10 channels that are currently available to hospitals and health care institutions for medical telemetry operations until the end of the relevant transition period in October of 2003.<sup>10</sup> Motorola notes that while permitting uncoordinated use of these frequencies poses little, if any, additional risk of interference beyond the existing shared environment, the impact of their temporary deferral from the uncoordinated low power pool is minimal. This of course assumes that the restriction on their use would be lifted in October 2003.

The *Notice* tentatively concludes to require manufacturers of the radios used for these channels to construct the radio to work *only* on these frequencies and other UHF color dot frequencies to protect full power, coordinated channels from additional co-channel conflicts that might occur from uncoordinated users.<sup>11</sup> This is intended to minimize the risk that uncoordinated users of these itinerant channels would migrate to other coordinated channels in search of clear spectrum and disrupt more sophisticated and disciplined users.

---

<sup>10</sup> *Notice* at ¶23.

<sup>11</sup> *Id.* at ¶25.

As discussed, Motorola notes that this proposed restriction would likely harm the very coordinated licensees that the FCC is attempting to protect. Large users typically have varying communications requirements and segregated talk groups confined to certain channels. A trucker, for example, would much prefer to have built-in to a single radio, frequencies dedicated to its wide area dispatch system as well as the uncoordinated low power frequencies used at warehouses. The FCC's proposal would require such users to purchase multiple radios. In Motorola's view, additional thought is needed on the unintended consequences before such a broad restriction is implemented.

Finally, Motorola strongly supports keeping these frequencies as part of the licensed Private Land Mobile (PLM) services and urges the FCC to reject any calls to "de-license" these channels. In Motorola's view, it is imperative that the current PLM eligibility restrictions be maintained on what will likely be a very popular service. However, Motorola does urge the Commission to consider simplifying the licensing process for this uncoordinated pool of frequencies. Simply put, the current processes are too time-consuming and intimidating for most small businesses that are unfamiliar with FCC practices.

While it may be possible to simplify and tailor FCC Form 601 to more easily guide itinerant users to the appropriate questions and schedules of the form, Motorola would also suggest that the FCC consider other web-based alternatives. For example, many companies now provide product warranty registration forms on the Internet where customers are asked to complete a simple, one-page form by providing their name, address, and product information. Typically, this process takes only a minute or two. This level of simplicity should be the FCC's

goal.<sup>12</sup> Motorola would be very interested to pursue this matter with FCC staff to develop the most appropriate process.

## **Conclusion**

Low power operations play a critical role in today's PLM environment. Adoption of these recommendations as discussed herein will serve the public interest by creating significant opportunities for new product development consistent with user demand.

Respectfully Submitted,

/S/ John F. Lyons

John F. Lyons  
Director, Telecommunications  
Strategy and Regulation  
Motorola, Inc.  
1350 I Street, N.W.  
Washington, DC 20005  
(202) 371- 6900

/S/ Bette N. Rinehart

Bette N. Rinehart  
National Regulatory Affairs  
Administrator  
Motorola, Inc.  
1270 Fairfield Rd., Ste. 5  
Gettysburg, PA 17325  
717-334-1114

October 12, 2001

---

<sup>12</sup> Users would also need the ability to provide credit card information to pay the associated application and regulatory fees.

## APPENDIX A

### Proposed Revisions to Section 90.187

(Additional text is in bold and underlined; deleted text is struck-through)

Sec. 90.187. Spectrally Efficient PSA Operations: Trunking, **Continuous Carrier Data, and Protected Digital Operations** in the bands between 150 and 512 MHz.

**Certain spectrally efficient operations such as trunking, continuous carrier data and protected digital operations may apply for a protected service area (PSA) under the following conditions:**

(a) Applicants for **spectrally efficient** ~~trunked~~ systems operating on frequencies between 150 and 512 MHz (except 220-222 MHz) must indicate on their applications (class of station code, instructions for FCC Form 601) that their system will be trunked, **continuous carrier data or protected digital**. Licensees of stations that are not trunked, **continuous carrier data or protected digital**, may **add those operations to their systems** ~~trunk~~ only after modifying their license (see Sec. 1.927 of this chapter).

(b) In the bands between 150 and 512 MHz, trunking, **continuous carrier data or protected digital operations** may be authorized under the following conditions:

(1) Where applicants for or licensees operating in the 470-512 MHz band meet the loading requirements of Sec. 90.313 and have exclusive use of their frequencies in their service area.

(2) Trunking, **continuous carrier data or protected digital** operations will be permitted on frequencies where an applicant or licensee does not have an exclusive service area provided that all frequency coordination requirements are complied with and written consent is obtained from affected licensees using either the procedure set forth in (b)(2)(i) and (b)(2)(ii) of this section (mileage separation) or the procedure set forth in (b)(2)(iii) (protected contours).

(i) Stations that have assigned frequencies (base and mobile) that are 15 kHz or less removed from proposed stations that will operate with a 25 kHz channel bandwidth; stations that have assigned frequencies (base and mobile) that are 7.5 kHz or less removed from proposed stations that will operate with a 12.5 kHz bandwidth; or stations that have assigned frequencies (base and mobile) 3.75 kHz or less removed from proposed stations that will operate with a 6.25 kHz bandwidth; and

(ii) Stations with service areas (37 dBu contour for stations in the 150-174 MHz band and 39 dBu contour for stations in the 421-512 MHz bands; see Sec. 90.205) that overlap a circle with radius 113 km (70 mi.) from the proposed base station.

(iii) In lieu of the mileage separation procedure set forth in (b)(2)(i) and (b)(2)(ii) of this section, applicants for trunked, **continuous carrier data or protected digital facilities** may obtain consent only from stations that would be subjected to objectionable interference from the **proposed operations** ~~trunked facilities~~. Objectionable interference will be considered to exist when the interference contour (19 dBu for VHF stations, 21 dBu for UHF stations) of a proposed ~~trunked~~ station would intersect the service contour (37 dBu for VHF stations, 39 dBu for UHF stations) of an existing station. The existing stations that must be considered in a contour overlap analysis are a function of the channel bandwidth of the proposed station, as follows:

(A) For trunked, **continuous carrier data or protected digital stations** proposing 25 kHz channel bandwidth: Existing co-channel stations and existing stations that have an operating frequency 15 kHz or less from the proposed station.

(B) For trunked, **continuous carrier data or protected digital stations** proposing 12.5 kHz channel bandwidth: Existing co-channel stations and existing stations that have an operating frequency 7.5 kHz or less from the proposed station.

(C) For trunked, **continuous carrier data or protected digital stations** proposing 6.25 kHz channel bandwidth: Existing co-channel stations and existing stations that have an operating frequency 3.75 kHz or less from the proposed ~~trunked~~ station.

(iv) The calculation of service and interference contours referenced in paragraph (iii) of this section shall be done using generally accepted engineering practices and standards which, for purposes of this rule section, shall presumptively be the practices and standards agreed to by a consensus of all certified frequency coordinators.

(v) The written consent from the licensees specified in paragraphs (b)(2)(i) and (b)(2)(ii) or (b)(2)(iii)(A), (b)(2)(iii)(B) and (b)(2)(iii)(C) of this section shall specifically state all terms agreed to by the parties and shall be signed by the parties. The written consent shall be maintained by the operator of the trunked, **continuous carrier data or protected digital station** and be made available to the Commission upon request. The submission of a coordinated trunked, **continuous carrier data or protected digital** application to the Commission shall include a certification from the applicant that written consent has been obtained from all licensees specified in paragraphs (b)(2)(i) and (b)(2)(ii) or (b)(2)(iii)(A), (b)(2)(iii)(B) and (b)(2)(iii)(C) of this section that the written consent documents encompass the complete understandings and

agreements of the parties as to such consent; and that the terms and conditions thereof are consistent with the Commission's rules. Should a potential applicant disagree with a certified frequency coordinator's determination that objectionable interference exists with respect to a given channel or channels, that potential applicant may request the Commission to overturn the certified frequency coordinator's determination. In that event, the burden of proving by clear and convincing evidence that the certified frequency coordinator's determination is incorrect shall rest with the potential applicant. If a licensee has consented to the use of trunking, **continuous carrier data or protected digital** operations but later decides against ~~that the use of trunking~~, that licensee may request that the **PSA** licensee(s) of the ~~trunked system(s)~~ cease **operations** ~~the use of trunking~~. Should the **PSA** ~~trunked~~ station(s) decline the licensee's request, the licensee may request a replacement channel from the Commission. A new applicant whose interference contour overlaps the service contour of a ~~trunked~~, **continuous carrier data or protected digital** licensee will be assigned the same channel as the **PSA** ~~trunked~~ licensee only if the **PSA** ~~trunked~~ licensee consents in writing and a copy of the written consent is submitted to the certified frequency coordinator responsible for coordination of the application.

(c) Trunking of systems licensed on paging-only channels or licensed in the Radiolocation Service (subpart F) is not permitted.

(d) Potential applicants proposing trunked, **continuous carrier data or protected digital** operation may file written notice with any certified frequency coordinator for the pool (Public Safety or Industrial/Business) in which the applicant proposes to operate. The notice shall specify the channels on which the potential **PSA** ~~trunked~~ applicant proposes to operate and the proposed effective radiated power, antenna pattern, height above ground, height above average terrain and proposed channel bandwidth. On receipt of such a notice, the certified frequency coordinator shall notify all other certified frequency coordinators in the relevant pool within one business day. For a period of sixty days thereafter, no application will be accepted for coordination which specifies parameters that would result in objectionable interference to the channels specified in the notice. Potential applicants shall not file another notice for the same channels within 10 km (6.2 miles) of the same location unless six months shall have elapsed since the filing of the last such notice. Certified frequency coordinators shall return without action, any coordination request which violates the terms of paragraph (d) of this section.

(e) No more than 10 channels for trunked, **continuous carrier data or protected digital** operation in the Industrial/Business Pool may be applied for in a single application. Subsequent applications, limited to an additional 10 channels or fewer, must be accompanied by a certification, submitted to the certified frequency coordinator coordinating the application, that all of the applicant's existing channels authorized for trunked, **continuous carrier data or protected digital** operation have been constructed and placed in operation. Certified frequency coordinators are authorized to require

documentation in support of the applicant's certification that existing channels have been constructed and placed in operation. Applicants in the Public Safety Pool may request more than 10 channels at a single location provided that any application for more than 10 Public Safety Pool channels must be accompanied by a showing of sufficient need. The requirement for such a showing may be satisfied by submission of loading studies demonstrating that requested channels in excess of 10 will be loaded with 50 mobiles per channel within a five year period commencing with grant of the application.

(f) If a licensee authorized for trunked, **continuous carrier data or protected digital** operation discontinues **such** ~~trunked~~ operation for a period of 30 consecutive days, the licensee, within 7 days of the expiration of said 30 day period, shall file a conforming application for modification of license with the Commission. Upon grant of that application, new applicants may file for the same channel or channels notwithstanding the interference contour of the new applicant's proposed channel or channels overlaps the service contour of the station that was previously engaged in trunked, continuous carrier data or protected digital operation.